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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/297,483	07/19/1999	SHUNICHI SEKI	005317-20009	9831
26021	7590	06/28/2004	EXAMINER	
HOGAN & HARTSON L.L.P. 500 S. GRAND AVENUE SUITE 1900 LOS ANGELES, CA 90071-2611			CLEVELAND, MICHAEL B	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/297,483

Applicant(s)

SEKI ET AL.

Examiner

Michael Cleveland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-49, 51, 53, 54, 62, 64, 66, 83-97 and 113-128 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-49, 51, 53, 54, 62, 64, 66, 83-97 and 113-128 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 4/29/04 and 6/15/04 have been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 113-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. Nagayama et al. (U.S. Patent 5,701,055, hereafter '055) in view of Woo et al. (U.S. Patent 6,169,163, hereafter '163).

Claims 113 and 126: '055 teaches an organic electroluminescent (EL) element, having a stacked structure including a hole-transporting layer and a light-emitting layer formed within a partitioning member which is divided into individual pixel areas, manufactured by a process comprising:

forming a plurality of anode layers (3);

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forming a partitioning member (7, 40) above a substrate (2), the partition member lying at least between adjacent ones of the plurality of anode layers so as to independently partition the adjacent ones of the plurality of anode layers (See Fig. 19 and col. 13, lines 49-col. 14, line 6) whereby a plurality of having openings over at least a portion of the anode layer, the openings corresponding to pixel areas (See Fig. 5C, Figs. 8A-8C, Fig. 19), wherein the partitioning member contacts the substrate (Figs. 2, 6, 7, and 15-19 of Nagayama show that the partition walls (7, 40, 60) contact the substrate (2).);

forming a hole-transporting layer and light-emitting layer (two parts of organic layer 8, col. 6, lines 31-59), which are deposited by independently filling each of the openings with the hole-transporting composition (col. 8, lines 41-62), wherein a height of the hole-injecting or transporting layer and the light-emitting layer (and the cathode) is less than that of the partitioning member; and

forming a cathode layer (9) over the light-emitting layer (col. 9, lines 20-52).

'055 does not teach that the hole-injecting layer contains a conductive material comprising polyethylene dioxythiophene (PEDT) and polystyrene sulfonic acid (PSS). However, the selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. '163 teaches the use of PEDT doped with PSS as a hole-transporting layer for organic EL devices (col. 21, lines 10-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used PEDT doped with PSS as the particular hole-transporting material of '055 with the expectation of similar results and with a reasonable expectation of success because '163 teaches that it is an operative hole-transporting material.

From MPEP 2113: "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). It is clear that the solvent does not form part of the product because the process recites the step of drying. It is unclear whether the drying removes the lubricant or not. However, the lubricant does not appear to serve any function in the electronic device and therefore, in the absence of a showing of a

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material difference in the product from the presence of the lubricant, the claims are unpatentable over this combination.

Claims 114-120: There is no evidence that the use of particular concentrations, contact angles, viscosities, and surface tensions of the coating solutions cause a structural difference in the formed product.

Claims 121-125: Likewise, the identity of the solvent does not appear to materially affect the dried product, and therefore the product appears to be identical regardless of which solvent is used to deposit the layers.

Claim 127: '163 teaches a preferred thickness of the PEDT-PSS layer of 100 nm (0.1 microns) (col. 21, lines 14-20).

5. Claims 37-49, 51, 53, 62, 64, 66, 83-96, and 113-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama '055 in view of Woo '163, as applied to claim 113, above, and further in view of Jonas (U.S. Patent 5,766,515, hereafter '515), Taniguchi et al. (U.S. Patent 5,667,572), and Roitman (U.S. Patent 5,972,419, hereafter '419).

Claims 37, 48-49, 51, 64, 66, 93-95, 124-126: '055 and '163 are discussed above. '055 teaches vapor deposition of the hole-transporting materials. '163 teaches spin coating of PEDT-PSS. Therefore, they do not teach applying a solution of PEDT-PSS, a solvent, and a lubricant by ink-jet printing.

'515 teaches that a polythiophene films suitable for deposition in EL devices (col. 3, lines 5-67) are formed using compositions including PEDT and PSS and a solvent (Example and claims 1 and 3). '515 teaches that such compositions may be applied by liquid coating methods including printing methods (col. 2, lines 51-57). '515 teaches that the applied film is then dried (col. 2, lines 51-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have dried the film after depositing it.

'515 teaches that the solvent for the polythiophene (i.e., an ionic polymer) dispersion (i.e., ink) may be a mixture of water with water-miscible solvents, but none of the references suggest ethoxyethanol, diethylene glycol, or glycerin.

'572 teaches the preparation of inks that contain ionic polymers (col. 8, lines 13-32) may be made in mixtures containing water-miscible organic solvents, such as glycerin, diethylene glycol and ethoxyethanol (col. 7, lines 31-57). Therefore, it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to have used such water-miscible solvents as ethoxyethanol, diethylene glycol, or glycerin as the solvents mixed with water in the polythiophene inks of '515 with the expectation of similar results.

'055 teaches the deposition of multiple colors of electroluminescent materials between '055, '163, '515, and '572 do not teach that the light-emitting layer is deposited by ink-jet printing. However, Roitman '419 demonstrates that it is known to deposit multiple colors of electroluminescent materials between barriers using ink-jet printing (col. 3, lines 1-50). The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited the EL material via ink-jet printing with a reasonable expectation of success because Roitman indicates that ink-jet printing is a suitable method of depositing EL materials.

Claims 38-44, 83-89, 114-120: The Examiner takes Official Notice that factors such as the flowability of an ink and its wetting ability on a surface are well known parameters in coating processes. The flowability and wetting ability are controlled by the viscosity, surface tension, and contact angle with any dispensing nozzle of the solution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the viscosity, surface tension, and contact angle with the ink-jet nozzle for the optimum flow and wetting properties. The composition of Example 1 of '515 has a weight percent within Applicant's claimed ranges (about 0.5 %).

Claims 45-47, 90-92, 121-123: The solvent may be polar solvents, such as water, or water mixed with lower alcohols, such as ethanol ('515, col. 2, lines 11-16).

Claims 53, 96, 127: '163 teaches a preferred thickness of the PEDT-PSS layer of 100 nm (0.1 microns) (col. 21, lines 14-20).

Claims 62: The electroluminescent elements form a luminescent screen, and are therefore incorporated in a luminescent display.

Claims 121-125: The solvent may be polar solvents, such as water, or water mixed with lower alcohols, such as ethanol ('515, col. 2, lines 11-16). However, the identity of the solvent

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does not appear to materially affect the dried product, and therefore the product appears to be identical regardless of which solvent is used to deposit the layers.

Claims 127: Thicknesses of less than 1 micron are taught in '515, col. 3, lines 66-67.

6. Claims 54, 97, and 128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama '055 in view of Woo '163, and further in view of Jonas '515, Taniguchi '572, and Roitman '419 as applied to claims 37, 62, and 113, above, and further in view of Jonas (U.S. Patent 6,004,483, hereafter '483).

'055, '163, '515, '572, and '419 are discussed above but do not explicitly teach surface resistances within Applicant's claimed ranges. However, Jonas '483 indicates that similar polythiophene films to Jonas '515 can be printed with surface resistances of 10^{10} to 0.1 ohm/square (col. 4, lines 35-36), which overlaps Applicant's claimed range. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Response to Arguments

7. Applicant's arguments filed 4/29/04 have been fully considered but they are not persuasive.

Applicant states that Nagayama teaches that the ramparts are placed over the anode layer without partitioning the anode layers, citing Figs. 5C and 8A-8C. Applicant states that Fig. 19 does not show this feature. Fig. 19 shows that the partition walls (60) comprise horizontal portions that lie between each horizontal anode (3). These portions therefore lie between adjacent ones of the plurality of anodes so as to independently partition the adjacent ones of the plurality of anodes. A plurality of openings (50) exist over the anode where the partition walls do not exist. Applicant argues that the partition walls do not contact the substrate. The argument is unconvincing because Figs. 2, 6, 7, and 15-19 of Nagayama show that the partition walls (7, 40, 60) contact the substrate (2) between anodes (3).

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Applicant argues that the references do not suggest the combination. Applicant has not alleged any specific errors in the Examiner's specific statements of motivation in the prior Office Action, and therefore Applicant's arguments as to this issue fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. If Applicant's argument is that the references do not contain an express suggestion to combine, the argument is unconvincing because an express suggestion by the references is not necessary to support a conclusion of obviousness.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant requests an affidavit supporting rejection of the claims based on the official notice, common knowledge, or personal knowledge of the examiner. The request is denied because Applicant has not adequately challenged that which was cited under Official Notice and further because an affidavit is only required if there is no evidentiary support for the noticed facts (See MPEP 2144.03C). In accordance with MPEP 2144.03C, "[t]o adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be well-known or common in the art." Applicant has not explained why the noticed facts are not considered to be well-known or common in the art. Furthermore, the record is replete with references supporting the examiner's citations of Official Notice. See the discussion, e.g., Paper No. 33, paragraph 4:

Applicant argues that they have timely challenged the Official Notice that ink-jet printing is a notoriously well known printing method in the responses of 5/28/2002 and 12/19/2002. The notice that ink-jet printing is a well-known printing method of applying material to selected locations was made in paper No. 12 (paragraph 13). Applicant challenged the statement in the succeeding Advisory action. However, the record is replete with evidence that the Examiner's assertion is correct (e.g., Shirasaki and all references cited in the rejection mailed 2/6/2000).

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Applicant requests that the Examiner cite a reference that teaches "forming a hole injecting and transporting layer by independently filling each of the openings with a composition... using an ink-jet head, the composition comprising (1) a conductive material containing at least a lubricant, polyethylene dioxythiophene, and polystyrene sulfonic acid, and (2) a solvent" in support of his well-known assertion. The request is denied because the Examiner has not asserted that "forming a hole injecting and transporting layer by independently filling each of the openings with a composition... using an ink-jet head, the composition comprising (1) a conductive material containing at least a lubricant, polyethylene dioxythiophene, and polystyrene sulfonic acid, and (2) a solvent" is well known. What the Examiner has asserted is well known is that "ink-jet printing is a well-known method of supplying material to selected locations." (Paper No. 12, paragraph 13, still present in Paper No. 30, paragraph 4). In order to convincingly traverse on this grounds, Applicant MUST 1) state for the record that at the time of filing, ink-jet printing was NOT a well-known method of supplying material to selected locations, and 2) provide convincing explanation why each reference of record does not contradict the statement. Responses that ink-jet printing was not well known in particular contexts other than "supplying material to selected locations" will not be considered responsive to the statement. However, the art cited above is considered relevant to Applicant's arguments.

and Paper No. 26, Response to Arguments:

Applicant's arguments regarding the rejection of claim 58 over the Jonas patents are unconvincing for the reasons given in the final rejection. To wit: Applicant's argument regarding the viscosity and surface tension of the composition are not convincing because the claimed ranges of viscosities and surface tensions are well known as operable in printing methods (see, for instance, the references cited in the office action mailed 2/17/2000, especially Itoh '721 and Taniguchi '572), and therefore one of ordinary skill in the art would have expected to have used such viscosities and surface tensions with a reasonable expectation of success. The Examiner notes that Applicant has not stated that optimization of viscosity and surface tension is not obvious in coating processes in general, nor in the processes explicitly listed by Jonas. Applicant has merely challenged the Examiner's citation of Official Notice that flowability (and therefore viscosity) and wettability (and therefore surface tension) of coating compositions are well known as result-effective coating parameters and stated that no evidence of such was provided in the prior office action. The Examiner disagrees, given that the office action of 2/17/2000 was cited in the response to argument section of the prior office action. In the interest of citing further evidence of the assertion, the Examiner cites as evidence that the flowability and viscosity are result-effective parameters in a variety of coating processes: Brownlee et al. (U.S. Patent 3,913,825, col. 9, lines 24-47), Beyer et al. (U.S. Patent 3,952,698, col. 3, lines 47-63), Fefferman (U.S. Patent 4,459,320, col. 6, lines 51-60), Audykowski et al. (U.S. Patent 4,544,623, hereafter '623, col. 1, lines 21-43). The Examiner further cites as evidence that the wettability and surface tension are result-effective parameters in a variety of coating processes: Neer (U.S. Patent 5,680,893, col. 7, lines 25-46) and Andersen et al. (U.S. Patent 5,508,072, col. 57, lines 16-40).

Therefore, because Applicant has not adequately traversed the Examiner's statements of Official Notice, the statements 1) that ink-jet printing is a well-known method of printing and 2) that factors such as the flowability of an ink and its wetting ability on a

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surface are well known parameters in coating processes, and that the flowability and wetting ability are controlled by the viscosity, surface tension, and contact angle with any dispensing nozzle of the solution are admitted prior art.

Applicant argues that the contact angles, viscosities, and surface tensions have an effect on the physical properties of the formed product, as described at pp. 5-9 of the specification. The discussion of contact angle, viscosity, and surface tension each discuss only the features of the process of ink-jet printing and not to the features of an EL device. Applicant asserts that at p. 11, lines 15-16 teaches that the film thickness and film resistance affect the light emission characteristics of the organic EL element. The argument is unconvincing because the disclosure at pp. 5-9 do not state that the contact angles, viscosities, and surface tensions of the inks control the film thickness and resistance. In fact, this statement contradicts the argument that the contact angles, viscosities, and surface tension produce necessary effects in the EL device because the same ink can be used to deposit films of different thicknesses (by depositing more of the ink) and because the resistance of the film may be controlled for instance, by the amount of PSS doped into the PEDT film. Also, films of desired thickness may be deposited by methods other than ink-jet printing (e.g., vacuum evaporation) and resistance is a property of the material deposited as the layer, not of the ink used to deposit it. Layers with the same resistance may be printed by methods other than ink-jet printing. Furthermore, the assertions of advantage are unsupported by a showing of evidence which is commensurate in scope with the claims. Furthermore, the argument does not address the further obviousness rejections. See remarks regarding claims 38-44.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Michael Cleveland".

Michael Cleveland
Patent Examiner
June 23, 2004